1: Holmberg--14 [4] (1941-42) 1950 Siriono
116, 411, 512

"The bow (ngidá) and arrow are the only weapons manufactured or used by the Siriono. Every adult male possesses a bow and arrows which he makes himself. So important are these weapons that when not hunting, a man, if busy, is most frequently observed making a new arrow or repairing an old one broken on the last hunt. A man's bow and arrows, in fact, are his inseparable companions. When he is asleep in the house they rest upright against the frame pole to which his hammock is tied, and when he is walking in the forest he is invariably seen with his bow and a bundle of arrows over his right or left shoulder, points facing ahead, in quest of game."

1: Holmberg--14 [5] (1941-42) 1950 Siriono
116, 411, 322, 313

"The wood from which the bows are made is a variety of chonta palm, called sírí. This tree, when mature, is about 12 inches in diameter and has a layer about 2 inches thick of very hard, black wood just underneath the bark. It is from this layer that the bow is constructed. Although the material is relatively abundant in the environment, before making a new bow a hunter will search for some time to locate a chonta tree which has the appearance of being of proper maturity and hardness. It is a rare tree that has just the right qualities. The wood must be firm and resilient and must withstand the maximum pulling strength of the hunter without breaking. Frequently I have seen a man spend a couple of days in the construction of a bow only to have it snap on the first pull.

After a suitable tree has been sighted it is felled. I have never seen this done other than with an ax, but one of my oldest informants told me that he had known chonta palms to be felled by building a fire against the trunk until the hard layer had been burned through and then pushing the tree over. When a tree has been felled, a section of the circumference of the trunk, about 4 inches wide and as long as the hunter wants his bow to be, is cut out. Other smaller pieces of chonta may also be removed at this time, as this material is likewise indispensable in the construction of arrows."

1: Holmberg--14-15 (1941-42) 1950 Siriono
116, 322, 411

"Once the material has been taken out, work on the construction of the bow begins almost at once, before the wood dries out. Bows are plain and are made of a single stave. The making of a bow is a laborious process, as it is fashioned almost entirely by using mollusk shells, called urúkwa, to plane the wood down. A small hole is first made in the surface of one of these mollusk shells. The edges around the hole are then worked downward with the grain, and the section of wood is gradually planed to the desired shape. If a man possesses a machete, he may first use this to give the bow its approximate shape by roughly tapering the horns, but the finishing is always done with the shell to avert the danger of splitting the wood. In planing down a bow it is held securely on the ground between the big and the second toe. [15]

In cross section a bow is roughly oval in shape, being about 2 inches in diameter in the middle and gradually tapered to a cross section of about a quarter of an inch at the horns. The inner side of the hard layer of the tree forms the belly of the bow, while the bark side forms its back. After a bow has been worked to the desired shape a small amount of bark fiber from the ambaibo tree is wrapped around each horn to keep the string from slipping toward the limbs. The horns of the bow are not notched to hold the string."

1: Holmberg--15 (1941-42) 1950 Siriono
116, 411, 284

"The bowstring is twined by the women of ambaibo bark fiber. It is applied as follows. A permanent loop, which will just fit over one horn of the bow, is tied in one end of the string. A half hitch on the other end of the string is placed over the opposite horn and the string is gradually tightened by pulling on the hitch while bending the bow. This is done by resting what will be the top horn of the bow on the ground at an angle and grasping the other horn in the right hand; the left hand is thus left free to manipulate the string which is to be tightened. The inside of the left knee is then placed in the center of the belly of the bow, the foot resting on the back further down. By exerting pressure between the right arm, the knee, and the foot, the bow is bent to the desired degree, and the string is pulled tight by the left hand. To keep it tight a second half hitch is thrown over the first, above the fiber lashing on the horn. The remainder of the bowstring is pulled up the bow to just below the center and wound back around it and over the section of the string which runs up the limb. The end of the string is secured by placing it under a couple of the turns and pulling it tight. The bow is then ready for drawing."

"If a hunter is right-handed, as are most of the Siriono, the bow is drawn in the following manner. It is grasped in the middle with the left hand. Because of its great length, the top horn is tilted at an angle of about 30° to the right of perpendicular, so that the bottom horn does not rest on the ground. The hunter spaces his feet from 2 to 3 feet apart, the left foot, of course, always being placed forward.

The secondary release is employed in drawing the bow. The arrow is held between the thumb and first finger of the right hand; the remaining fingers assist in drawing the string. The left arm is held rigid, and the arrow shaft slides between the thumb and first finger on the side of the bow to the left of the belly. The bow is drawn to a maximum distance allowed by the arms. As the bowstring passes his head, the hunter sights along the arrow to aim. He withdraws his head just before releasing the arrow, and the string flies by his face. He always wears a wrist guard of cotton string to avoid damaging his skin.

The stance indicated above is essentially the same whether one is shooting in a tree, straight ahead, or from a tree into water. If a hunter is left-handed, the procedure of drawing the bow is exactly the same, but reversed.

A new bow is always drawn gradually at first and is sometimes left for one night with the string taut before it is used, so as to give the wood a chance to expand gradually. A bow which is in service, however, is always unstrung following each day's hunt.

After a new bow is made it needs little attention, except for a change of string, until

it breaks or has lost its resiliency. The life of a sturdy bow may be a year or more, depending upon how often it is used. A hunter does not make spare bows. Only when his bow breaks or when it has been used so much that it has lost its life does he make a new one. Occasionally, when a hunter notices that his bow is drying out, he places it in water for several nights until its proper resiliency is restored.

Bows vary in size, depending upon the hunter, but all are long, perhaps the longest in the world. On the average they range between 7 and 9 feet in length, although I have seen one that measured 9 feet 7 inches. The Indians themselves have no explanation of why they use such a long bow, other than to say they were taught to do so by their fathers. They assert, however, that a short bow is no good. The explanation is probably to be sought in the manner in which the Siriono use the bow in shooting. It is bent to the maximum distance allowed by the arms before the arrow is released. If a short bow were used, it is likely that the wood could not withstand the strain of the pull or that the hunter would not have sufficient strength to bend it to the desired degree."

1: Holmberg--15-16 (1941-42) 1950 Siriono
116, 411

"Although arrows, like bows, vary in size, only two general types are made: one, called úba, with a chonta head containing a lashed barb; the other, called tákwa, with a lanceolate bamboo head but containing no barb. The former type is used [16] almost exclusively for shooting smaller game in the trees, while the bamboo-headed arrow is reserved for killing the larger game on the ground. Chonta-headed arrows average from 7 to 9 feet in length; bamboo-headed arrows, from 8 to 10 feet. The arrows used by the Siriono are probably longer than those used by any other known people in the world."

1: Holmberg--16 (1941-42) 1950 Siriono
116, 411, 221

"Except in the case of an emergency or a shortage of material, arrow shafts (ékua) are always made of reed (Gynerium sagittatum). The plant is found in abundance along the banks of the rivers and at some points inland, but is only suitable for use in arrow making for about 2 months during the rainy season—in March and in April. Consequently, a whole year's supply of not less than 30 reeds is usually harvested during these months. If a man runs out of reeds before the next season comes around, a species of bamboo may be substituted, but this material is considered inferior since it makes an inaccurate arrow."

1: Holmberg--16 [2] (1941-42) 1950 Siriono
116, 411, 462

"Like bow making, arrow making is exclusively a task of the men, and, there being no specialists in this occupation, each man makes his own arrows. The reeds are first cut near the butt end and then cured. This is usually done by drying them gradually in the sun for about 4 days, but it may be hastened by the use of fire. Before an arrow is made, the shaft must be straight and dry. While the reeds are curing, a man prepares the other materials needed for the construction of an arrow: feathers, chonta or bamboo heads, beeswax, etc. Consequently, when the shafts are straight and dry, all materials are ready for the construction of an arrow."

1: Holmberg--16 [3] (1941-42) 1950 Siriono
116, 411, 322

"A chonta-headed arrow is made in the following way. A shank of chonta wood about 8 inches in length, pointed at both ends, and of a diameter so as just to fit the hollow distal end of the reed, is fashioned with a mollusk shell called urúkwa. About one-half of this shank is coated with prepared beeswax called iríti and inserted up the hollow shaft for about 6 inches. The part of the shaft containing the shank is then loosely bound with ambaibo bark fiber and left to dry. While it is drying, a small conical plug (eája), likewise coated with hot beeswax, is inserted in the proximal end of the reed. This plug contains the nock of the arrow. After both have dried, the chonta shank and the plug containing the shaft are bound securely in place. This is done with fine cotton string which has been previously coated with paint made from ground seeds of uruku (Bixa orellana) mixed with saliva. To bind the shank, the arrow maker removes the bark fiber and begins to wind cotton string around the shaft about 4 or 5 inches from the distal end, continuing his winds downward until about 3 inches of the protruding shank have been covered; to bind the plug, he begins to wind cotton string around the shaft from the proximal end, continuing his winds about 3 or 4 inches down the shaft. The ends of the string used for lashing are coated with beeswax to hold them in place."

1: Holmberg--16 [4] (1941-42) 1950 Siriono
116, 411, 237, 825

"The arrow is now ready for feathering. For this purpose only two kinds of feathers (éo) are used, except in case of emergency. All chonta-headed arrows are feathered with the large wing or quill feathers of the curassow, while bamboo-headed arrows are feathered with the large wing feathers of the harpy eagle. Informants were emphatic in stating that these are the only feathers ever used, and it was rare that I saw an arrow feathered otherwise. Occasionally, however, the feathers of one of the smaller varieties of guan are used.

Feathering is done by the Peruvian cemented technique. Before a feather is put on, however, about 5 inches of the arrow shaft, below the lashing which secures the plug containing the nock, is coated with hot beeswax. Then the aftershafts of a feather are removed (the mandible, containing teeth, of the palometa fish is used for this purpose) and placed over the soft beeswax along the shaft and in line with the nock. They are then lashed by winding at intervals between the barbs of the feather a very fine thread taken from a grasslike plant growing near rivers, called dičíbi. Nowadays, when available, manufactured cotton thread is considered ideal for this purpose. After the feathers have been glued and lashed to the arrow shaft, the beeswax is smoothed out by rubbing a wet thumbnail over it."

1: Holmberg--16-17 (1941-42) 1950 Siriono
116, 411, 322

"A single barb (erási), about one-half inch in length, is lashed onto the chonta shank of an arrow about half an inch from the point. Barbs are generally made from the hard stays which grow in the soft wood in the center of a palm tree which the Siriono call hindoéra, although chonta wood is also used sometimes. The barb is flattened on one end and lashed securely to the shank with fine cotton string coated with beeswax.

Bamboo-headed arrows are made in almost [17] exactly the same way as chonta-headed arrows except that the bamboo head is lashed onto a chonta shank that is flattened on the distal end. Nowadays, bamboo arrowheads are cut out with bush knives, but formerly they were shaped with mollusk shells. They are glued to the flattened chonta shank with beeswax and lashed tightly to it with cotton string covered with uruku paint."

1: Holmberg--17 (1941-42) 1950 Siriono
116, 411

"After an arrow has been finished it should have a certain twang when set in vibration. This is tested as follows. The maker grasps the arrow in about the middle of the shaft with his left hand and lifts it up to the height of his eye. While sighting along the shaft he grasps the nock end of the arrow between the thumb and first finger of his right hand and bends the shaft slightly toward his face. He then releases his fingers with a snap and the arrow, if a good one, vibrates with a twangy sound. An arrow which does not produce this sound when set in vibration is thought to be a poor one.

Arrows are always retrieved and are frequently damaged on the hunt. If the shaft of an arrow is broken, a cross section is cut off evenly on both sides of the break, and a pencillike rod of chonta palm wood, about 6 inches long and covered with beeswax, is inserted about 3 inches up the hollow shaft of one part of the broken reed. The protruding piece of the chonta rod is then inserted into the hollow shaft of the other part of the broken reed until both parts of the reed meet. To complete the job of mending, cotton string is wound around the shaft for about 3 inches over the break."

1: Holmberg--17 [2] (1941-42) 1950 Siriono
116, 411

"Some mention should also be made of the use of pieces of wood as weapons. Clubs are never manufactured but chunks of wood cut or picked up at random sometimes serve as clubs to kill wounded animals and to pound with."

1: Holmberg--23 [2] (1941-42) 1950 Siriono
116, 224, 411

"Besides his bow, each hunter takes with him about eight arrows—five with a barbed chonta head to hunt small tree game and three with a bamboo head to hunt larger ground game. As he leaves the hut the hunter walks silently but rapidly through the forest so as to arrive early at those spots such as water holes most likely to contain game, and as he goes along he searches the branches above him and the forest around him for a stirring leaf or a snapping twig that might indicate the presence of game."

1: Holmberg--25 [2] (1941-42) 1950 Siriono
116, 224, 411

"On a chase of this kind a hunter usually uses up all the arrows he has brought with him, but if there is still game around this does not deter him from continuing the hunt. He may continue the attack with a club picked up at random or cut in the forest. I have even seen hunters catch young peccaries with their hands and bash their heads on the nearest tree or drown them in a water hole that happened to be at the site of the kill."

1: Holmberg--32 (1941-42) 1950 Siriono
116, 224, 262, 411

"While I was wandering in the forest with a group of Indians, when I too was hunting with a rifle and shotgun, the amount of meat consumed by the group rose considerably. I have records on this only for September 1941, a large part of which I spent on the march with parts of two extended families of Indians (21 adults in all) and one Bolivian companion in search of another band. During the first 11 days of the march, when most of the hunting was done with the rifle and shotgun, our meat consumption averaged 2.2 pounds per individual per day. After we had rested several days with another band and continued the march, our meat consumption jumped to 4.1 pounds per day for the last 15 days. I am inclined to believe that the increase was largely due to the fact that with a rifle and shotgun we were able to bag more big game, like tapirs, alligators, and peccaries, than the Indians would have been able to kill with their bows and arrows. Part of the increase, of course, may have resulted from the fact that we were wandering in areas richer in game than most and that we were hunting every day, but the superiority of the rifle over the bow and arrow was almost certainly a factor. When game was sighted, the Indians would almost always call on my Bolivian companion or me to shoot."

3: Métraux--113 [5] (no date) 1942 Siriono
116, 411

"Weapons. —Siriono bows were round, tapering, and among the largest known, averaging from 6 to 9 feet (1.8 to 2.7 m.) in length. Arrows were 9 to 12 feet (2.7 to 3.6 m.) long and were tipped with a lanceolate blade or with a sharp rod to which were attached barbs made of splinters. Two halved feathers were laid lengthwise in a slit cut along the arrowshaft and held in place by a cotton thread wrapping which was smeared with wax (Peruvian cemented feathering)."

"The only weapon possessed by the Siriono is the bow and arrow. Bows and arrows are very long, the arrows without doubt being the longest in the world (fig. 22) [MPK: not reproduced for this file].

Two different types of arrow occur, one with a straight, barbed, wooden point (fig. 20 A), the other with a bamboo point (fig. 20B). In the literature, mention is also made of a bone-barbed arrow (CARDUS 1886, p. 280), but arrows of that type were unknown to the Indians of Casarabe. [58]

Arrow-shafts are made from a nodeless length of reed (Gynerium saccharoides) which, cut to size, is carried in bundles home to the hut, where the reeds are left to dry. Among the arrows I brought back from the Siriono, there is however one with a shaft of noded reed.

In the making of the arrow, the reed is first warmed over the fire and made perfectly straight.

The point, which is of palmwood, chonta--its Siriono name being siríua--is pointed at both ends and inserted into the broader end--the root end--of the reed that is to form the arrow-shaft. In this process is used the waxy substance iriti, already referred to, as a kind of cement. As already said, this consists of bee's wax, a slight addition of honey, and the juice of a plant which the Siriono Indians call edei. These ingredients are mixed over the fire and, when ready, this gluey substance, made up into black lumps of the size of a man's fist, is kept in baskets in the hut (fig. 21) [MPK: not reproduced for

this file]. Before use, it is slightly warmed over the fire. When the point has been fixed in the shaft, the end of the shaft is painted over with iriti and given a lashing of fine cotton thread. This lashing, which is done close to the fire, is, like the one at the butt end of the shaft, designed to prevent the reed from splitting. The thread used in this process has generally beforehand been rubbed to and fro on a lump of iriti, so that, when the completed lashing is warmed up, the waxy substance can be spread out, which makes the finished lashing look almost as if coated with black lacquer. This later smoothing out of the glue over the lashing is however fairly infrequent.

The barb, wasi, is cut out of a separate small piece of chonta and stuck on immediately below the point by means of iriti and a lashing smeared with iriti (fig. 20 A1).

Into the opposite end of the arrow-shaft is driven a conical plug, auda, the pointed end of which has been smeared over with iriti (fig. 20F). In the basal end of this plug there is a notch for the string, cut out with a tool known to the [59] Siriono Indians as sirasi. This consists of a rodent tooth tied on to a handle of monkey bone (fig. 24) [MPK: not reproduced for this file]. As already described, this end of the arrow-shaft is also provided with a lashing.

Occasionally the lashings on the ends of the arrow-shaft are made with thread that is somewhat thicker, and dyed with urucu. This always seems to be the case when new-made thread is being used. Often however thread is taken from old arrows, and it is especially in such cases that the lashings are provided with a protective coating of iriti.

The part of the arrow-shaft where the feathers, wito or troma, are to be applied, is smeared with iriti. For arrow-feathers the broader vane of the wing-feather of a bird known to the Siriono as yacú (in Spanish, pava) are almost always used. With the sharp-toothed jawbone of a palometa fish (fig. 24) the abovementioned part of the feather is cut away from the quill, beginning at the point and cutting towards the broader end (fig. 60A) [MPK: not reproduced for this file]. The quill is held tight in the armpit, and with the fish-jaw uneven parts are pared away from the section cut off the wing-feather. The arrow-feather is then completely severed from the wing-feather and, after having seen to it that a length of the arrow-shaft exceeding that of the arrow-feather has been smeared with iriti, the feather is stuck on the shaft. The arrow-feathers are attached without any spiral twist and in the same plane as the notch carved in the string-plug. The butt end of the arrow is then wound over with fine thread so that the ends of the feathers in particular are firmly secured. The part of the lashing that is between the terminals of the arrow-feathers is fairly sparse. What excess of wax there may be on the shaft above the feathers is plastered down over the lashing and smoothed out with the nail of the thumb so that the fine thread that holds the feathers will always be protected. Now and again in the course of the work the wax is slightly heated over the fire, and when the feathers are fixed on and ready, they are trimmed so as to correct an unevenness caused to them in the application of the lashings. [60]

The fine thread that is used for these arrow-lashings, particularly in fastening the

feathers, must as a matter of fact be difficult to manufacture, for it is always carefully saved up from broken arrows. For the same reason sewing cotton is an important article of barter among the Siriono.

The second type of arrow has a point made of bamboo (fig. 20). The point is fastened by means of iriti and a lashing to the flattened side of the fore-shaft, which is made of chonta, and then stuck in the arrow-shaft in the same way as an arrow-point made of that material (fig. 20 B 1-2).

The Indians frequently examine their arrows at home in their huts, and give special attention to their being straight. Should an arrow have become crooked, it is warmed and straightened. The conclusion of the inspection is always marked in a certain way. The butt end is pressed hard against the thumb with the forefinger, which at the same time is slid over the edge of the string-plug, when a snapping, singing note is produced in the arrow.

An arrow broken in two is mended by wedging a spindle-shaped piece of chonta wood into the hollow shaft in the way shown in fig. 20E. As adhesive, iriti is used, and a winding of thread is laid on both sides of the break to keep the arrow-shaft from splitting.

Both of the arrow-types described above are known in Siriono as óva. The bamboo-pointed kind is especially used for hunting the jaguar and other large game. The other type is used for monkeys and birds, and also for shooting ray in the rivers. Both types are also warweapons."

"The method used by the Siriono for fastening the feathers is the one known as "Peruvian cemented feathering". This method, together with the so-called "East Brazilian feathering" (NORDENSKIOLD 1924, p. 45, map 5), are the most wide-spread in South America while also being the most primitive. On wooden-shafted arrows, Peruvian cemented feathering and glueing on of the feathers are the only fastening methods in use. It would also seem as if in conjunction [62] with Peruvian cemented feathering, apart from the lashing, some sort of adhesive for fastening the feathers were always used. On Siriono arrows this adhesive consists of iriti, while on arrows, e.g., from the tribes on the Pilcomayo river it consists of wax only, which, besides, appears to be the more common. The method of fastening the arrow-feathers known as East Brazilian feathering is practically speaking nothing but a simplification of the method here first referred to, in that the latter method only consists of fastening the two ends of the feathers with the lashing. The wide distribution of the above-mentioned two methods in both North and South American proves their extreme antiquity. More modern fastening methods, such as "Arara feathering" (NORDENSKIÖLD 1924, p. 47) and "Xingu sewed feathering" (NORDENSKIÖLD 1924, p. 47, map 4) do however occur among tribes that are neighbours, or comparative neighbours, of the Siriono. To Nordenskiöld's list of tribes that use the Xingu sewed feathering must also be added the Moré Indians who, as already mentioned, are living immediately north of the Siriono area, on the Guaporé river. These more modern fastening method [sic] however--as well as the East Brazilian feathering--have

not been adopted by the Siriono who like a good many other tribes of eastern Bolivia (NORDENSKIÖLD 1924, p. 46), of a considerably higher cultural level than the Siriono, have instead adhered to the primitive method."

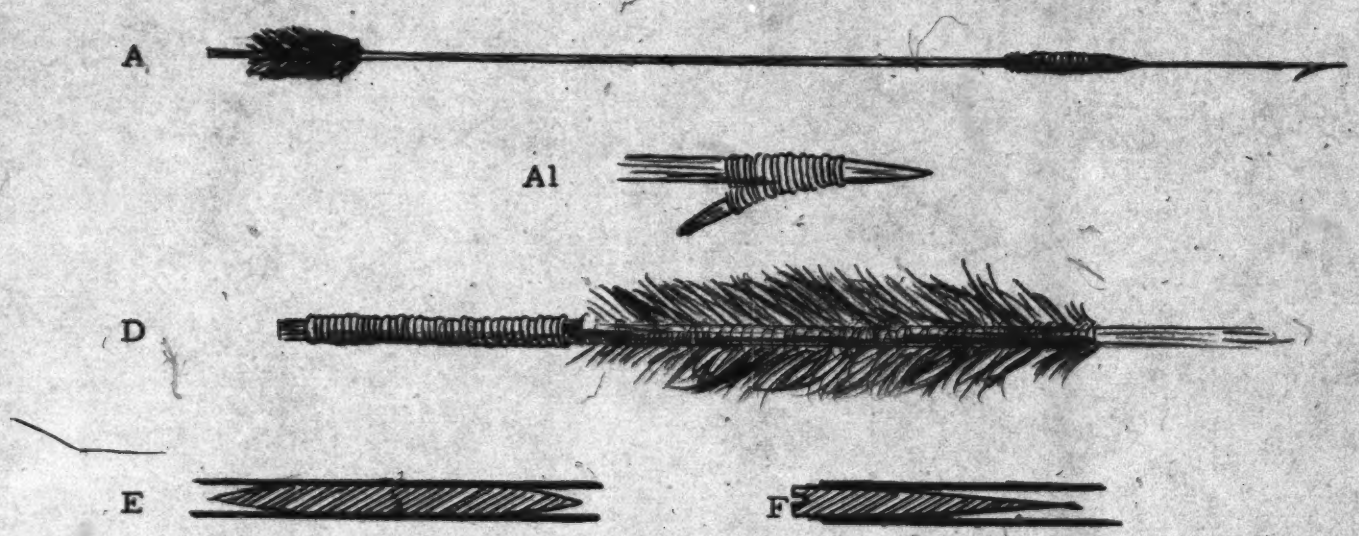

Fig. 20. Bow and arrows. A-C 1/20.

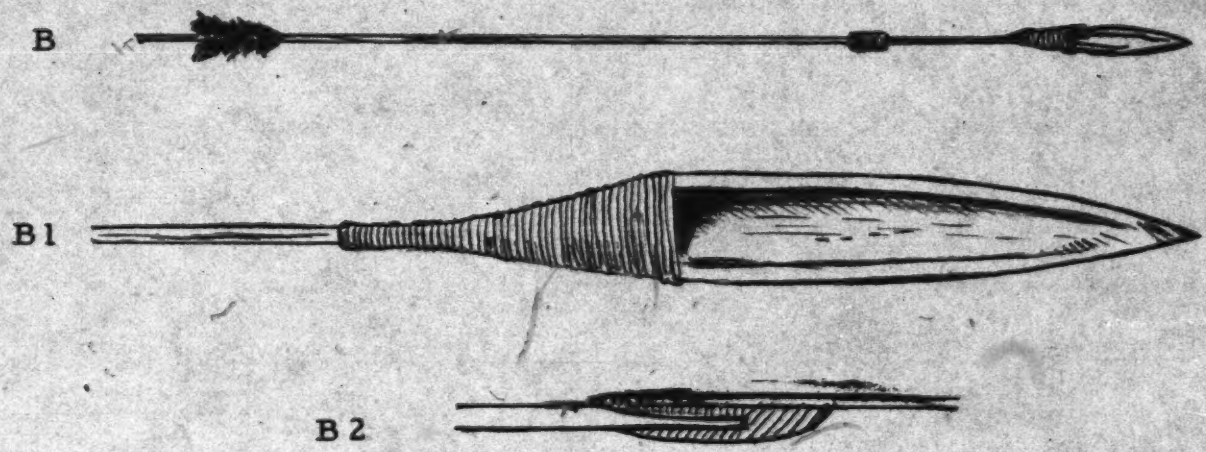

Fig. 20 Bow and arrows. A-C 1/20.

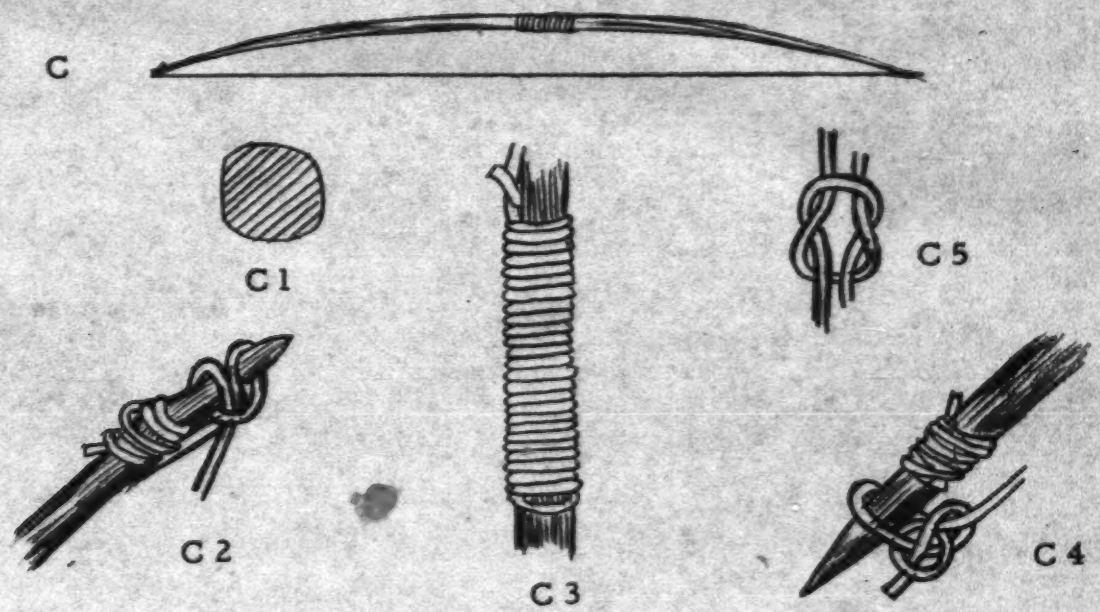

Fig. 20. Bow and arrows. A-C 1/20.

4: Ryden--62 (1939) 1941 Siriono
116, 411

"Another primitive feature possessed by the Siriono arrow is its barb. This detail is not carved out of the point of the arrow, but consists of a separately carved, sharp-pointed piece of wood, lashed on to the arrow. This simplifies its manufacture, since even if not impossible, it would be very difficult--with the tools for working wood that are available to the Siriono Indians rodents' teeth, and shells--to carve the barb out of the arrow-point itself. CARDÚS (1886, p. 280) states that barbs are also made of bone."

4: Ryden--62-63 (1939) 1941 Siriono
116, 411, 171

"The method of reinforcing the butt-end of the arrow with [63] a wooden plug may be an improvement that the Siriono have borrowed from some other tribe. From what NORDENSKIÖLD (1924, p. 47, map 6) says of this plug, or other strengthening device for the nock-end of the arrow, it appears that reinforcements of this kind have a wide distribution in South America and, like strengthening lashing, occur among many of the Siriono Indians' nearest neighbours. These tribes, so far as I have been able to ascertain, use the same material for arrow-shafts as do the Siriono, and it is the soft consistency of that material that has necessitated the strengthening of the nock-end of the arrow."

4: Ryden--63-64 (1939) 1941 Siriono-1
116, 411

"The bow, gira, (fig. 20C) is made of chonta wood. Its transverse section is almost circular, the side facing away from the string being slightly flattened (fig. 20 C1). Prior to the introduction of iron tools, the bow was made by the help of rodent teeth and pieces of shell. The ends of the [64] bow are pointed, and have no notches for the bow-string. A piece of string instead is wound a few turns round the bow in order to prevent the bow-string slipping when the bow is drawn. The pointed ends of the bow are used as a sort of spear: in fishing off wounded adversaries by stabbing them in the chest and abdomen.

The bow-string, which consists of a three-stranded fibre cord, is always of such length that part of it has to be wound up on the bow (fig. 20 C3). This part forms, as it were, a reserve of bow-string, in case the latter should break. This frequently happens at the end where the string is doubled. Fig. 20 C5 shows the knot used in the mending of the bow-string. The material in the latter is the same as in the case of the hammocks, viz. imbei.

When the bow is standing unused in the hut, the string is often removed. I also noticed that the unstringed bow was frequently placed outside the hut, in the forest surrounding the hut. This was probably done in order to preserve the elasticity of the material. RADWAN (1929, p. 294) states that for the same reason the bow was laid to soak in water (Cf. SCHERMAIR 1934, p. 520).

The Siriono Indians wind a length of string round the left forearm as a protection

against the slap of the bow-string in shooting. ...the bow, in being drawn, may occasionally be held in the right hand."

"In eastern Bolivia it is only the Guarayu Indians that use a bow-string made of cotton, all others use vegetable fibre as material for the bow-string, as do the Siriono (NORDENSKIÖLD 1924, p. 44). Even the material for the bow among the Siriono is the one that is common to eastern Bolivia, viz. chonta wood, but the shape of the bow is different. While the bows of the other tribes are more or less flat in section, that of the Siriono bow is almost circular. Yet another detail points to the primitive character of the Siriono bow: there are no notches carved in its ends for the string. In their stead a few turns of a piece of string [65] prevent the bow-string from slipping down the stave (fig. 20 C2, C4). NORDENSKIÖLD (1919, p. 36), on the authority of data published by P. W. Schmidt, points out that bows without notches carved for the string are mainly found in southern South America and among some few tribes in Bolivia and Brazil, and that bows of that type belong to an ancient phase of the history of South American civilization. It should however be pointed out that in earlier times the Sirion bow may have had a more rectangular section. NORDENSKIÖLD (1911, Tafel I: 2c), it may be noted, depicts a Siriono bow acquired in 1908--09 in the Sara province of Bolivia which is almost rectangular in section. Among the Quruñgu'a, [66] bows of this section often occur (WEGNER 1934 b, p. 165), and with a width of up to 10 cm. That bows made of chonta are generally more or less rectangular in section is due to their method of manufacture. From what Professor Erland Nordenskiöld once told me, this shape arises from the fact that in making bow-staves, the inner and softer portion of the chonta stem is first of all

removed, whereupon the staves in the rough are split out of the remaining cylinder of harder wood. These unformed staves are thus of the flattened shape that prevails in the finished bow. It is therefore possible that, through the introduction of iron tools, the Siriono have been able to modify the shape of the bow, and thus from a flatter section due to the cutting out of the raw material have passed on to the more exacting rounded section."

4: Ryden--66 (1939) 1941 Siriono
116, 123, 411, 224

"With a view to testing the marksmanship of the Siriono and the hitting power of a bow-shot I had a man shoot at a range of 25 metres two chonta-pointed arrows, one at a slab or wood called in Spanish adro, and the other at a slab of amarillo. Both kinds of woods are hard; in both cases the thickness of the plates was 3 cm., and the size about 15x35 cm. For the first shot the plate was set up against a log of another very hard kind of wood. The arrow split the plate and penetrated some 3 cm. into the log. In the second case the target was nailed on to a treestump so as to project freely above it. The arrow entered up to the lashing between point and shaft, splitting the board in two (fig. 23).

For filming purposes I had a man shoot three arrows successively into the air, pausing between each shot. The arrows rose to about the height of a five-storey building before turning downwards and with high velocity striking the ground some 75 metres away. The bowman could not see where the first arrow fell, so had to aim the other two more or less at random. A circle with a radius slightly exceeding one metre would have covered all three arrows."

4: Ryden--103 (1939) 1941 Siriono
116, 182, 411, 524

"It is also noteworthy that I never saw any toy bows in use at Casarabe. Young men, or boys, of fifteen or so already used bows and arrows as large as those of the older men. WEGNER (1932, p. 336) refers, however, to toy bows. The absence of these at Casarabe probably points to an incipient disintegration of the native culture. Not even toys of such simple character as dolls, nor such common pastimes as stringfigures, are known to the Siriono."

4: Ryden--101-103 (1939) 1941 Siriono
116, 524, 411, 171

"The only toy I have seen the boys at Casarabe use is a sling, raseke (figs. 49-50) [MPK: not reproduced for this file], made out of a spathe from a maize-cob and two pieces of string. One of the slings (fig. 50) is provided with a finger-loop. Most probably the sling [102] among the Siriono is a borrowed element in spite of its native name, seeing that it is made of a part of the maize plant. NORDENSKIÖLD (1919, p.44, map 4) partly on the strength of an investigation made by FRIEDERICI (1911), has emphasized that the sling in South America is a culture element of remote antiquity, and that its use presupposes open terrain. Friederici states that the sling is in use among the Mojo, and Nordenskiöld mentions further two tribes in eastern Bolivia, viz. the Canichana and the Itonama, in which region he supposes the sling to be a post-Columbian element, [103] introduced in connection with cattle-breeding (NORDENSKIÖLD 1924, p. 65)."

5: Radwan--294 [3] T-3 (1928?) 1928 (Siriono
116, 342, 411, 727

They take great care in the fashioning of their weapons. The arrows are to be regarded as true works of art. Bows and arrows have a considerable length of one and a half to two and a half meters. The bows are kept in water, the arrows lie in the hut. In a corner there is a kind of ground-floor (Bodenraum) due to some special cross-beams against which the arrows and provisions rest. The feathers of the arrows dangle freely in the air. Probably today every Indian group possesses axes or sword-like knives (machete) which were obtained as booty while on raids.